

1 CLAIMS

I claim:

1. In combination;

a fluid handling device having a fluid flow area;

5 a plurality of filter frames operatively removably mounted to said fluid handling device; each of said filter frames having at least one outer frame member that defines a filter area;

each of said filter frames having a filter selectively removably secured to said at least 10 one outer frame member so that said filter extends over said filter area; at least one of said filters being a pocket filter.

2. The combination of claim 1 wherein at least one of said filters is a planar filter.

3. The combination of claim 1 wherein said pocket filter has at least one 15 pocket portion.

4. The combination of claim 1 wherein at least one of said filters is a multiple pocket filter.

5. The combination of claim 4 wherein said multiple pocket filter has 20 multiple pocket portions; said filter frame having at least one inner frame member which defines multiple spaces for said pocket portions.

6. The combination of claim 1 wherein each of said filter frames comprises 25 multiple outer frame members; each of said filter frames comprising a horizontally disposed upper frame member having first and second ends; a horizontally disposed

1 lower frame member having first and second ends, a first side frame member  
extending between said first ends of said upper and lower frame members and a  
second side frame member extending between said second ends of said upper and  
lower frame members.

5 7. The combination of claim 6 wherein at least one of said filters is a planar  
filter.

8. The combination of claim 6 wherein said pocket filter has at least one  
pocket portion.

10 9. The combination of claim 8 wherein at least one of said filters is a  
multiple pocket filter; said at least one multiple pocket filter having multiple pocket  
portions; said multiple inner frame members defining a plurality of spaces for said  
multiple pocket portions.

15 10. The combination of claim 1 wherein said pocket filter has a base panel  
and a pocket portion; said base panel having first and second end portions separated  
by a pocket opening; said pocket portion having a closed end and side panels defining  
said pocket opening.

11. The combination of claim 10 wherein said pocket filter is selectively  
20 movable between a collapsed position and a filter position.

12. The combination of claim 11 wherein said first and second end portions  
of said base panel are adjacent one another and said side panels of said pocket  
portion are adjacent one another when said pocket filter is in said collapsed position.

1           13. The combination of claim 11 wherein said side panels of said pocket portion are spaced from one another to form a chamber when said pocket filter is in said filter position.

5           14. The combination of claim 13 wherein less than the entire chamber is exposed to straight line fluid flow.

10          15. The combination of claim 4 wherein said multiple pocket filter has a base panel and multiple pocket portions; said base panel having multiple pocket openings therein; each of said multiple pocket portions having a closed end and side panels that define one of said pocket openings.

16          16. The combination of claim 15 wherein said multiple pocket filter is selectively movable between a collapsed position and a filter position.

15          17. The combination of claim 16 wherein each of said first and second side panels of said multiple pocket portions are adjacent one another when said multiple pocket filter is in said collapsed position.

18          18. The combination of claim 17 wherein said first and second side panels of each of said pocket portions are spaced from one another to form a chamber when said multiple pocket filter is in said filter position.

20          19. The combination of claim 18 wherein less than the entire chamber is exposed to straight line fluid flow.

25          20. In combination;  
a fluid handling device having a fluid flow area;  
a filter frame operatively removably mounted to said fluid handling device;

1 said filter frame having at least one outer frame member that defines a filter area;  
said filter frame having a filter selectively removably secured to said at least one outer  
frame member so that said filter extends over said filter area;  
5 said filter being a pocket filter with at least one pocket portion and a base portion;  
said base portion having at least one pocket opening formed therein;  
said at least one pocket portion having a closed end and opposite side panels that  
define said pocket opening.

10 21. The combination of claim 20 wherein said pocket filter is selectively  
movable between a collapsed position and a filter position.

22. The combination of claim 21 wherein said opposite side panels of said at  
least one pocket portion are adjacent one another when said pocket filter is in said  
collapsed position.

15 23. The combination of claim 22 wherein said opposite side panels of said at  
least one pocket portion are spaced from one another to form a chamber when said  
pocket filter is in said filter position.

24. The combination of claim 23 wherein less than the entire chamber is  
exposed to straight line fluid flow.

20 25. The combination of claim 20 wherein said filter frame has at least one  
inner frame member that defines at least one space for said at least one pocket  
portion.

25 26. A collapsible pocket filter for a fluid handling device, comprising:  
a base panel and pocket portion;

1 said base panel having first and second end portions defined by a pocket opening;  
said pocket portion having a closed end and opposite side panels that define said  
pocket opening;  
said pocket filter being selectively movable between a collapsed and a filter position,  
5 said first and second end portions of said base panel being adjacent one another and  
said side panels of said pocket portion being adjacent one another when said  
pocket filter is in said collapsed position;  
said side panels of said pocket portion being spaced from one another to form a  
10 chamber when said pocket filter is in said filter position.

27. The pocket filter of claim 26 wherein said base panel and said pocket  
portion are formed from a single piece of filtration media.

28. The pocket filter of claim 27 wherein said single piece of filtration media  
is generally I-shaped.

15 29. The combination of claim 26 wherein less than the entire chamber is  
exposed to straight line fluid flow.

30. A collapsible filter for a fluid handling device comprising:  
a base panel and multiple pocket portions;  
20 said base panel having multiple pocket portions having a closed end and opposite side  
panels which define said pocket portions;  
said filter being selectively movable between a collapsed and a filter position;  
each of said first and second side panels being adjacent one another when said filter  
25 is in said collapsed position;

1 each of said first and second side panels being spaced from one another to form a  
chamber when said filter is in said filter position.

31. The combination of claim 30 wherein less than the entire chamber is  
exposed to straight line fluid flow.

5 32. A method of using the device according to claim 2, comprising:  
providing a fluid flow area that requires filtering of a particulate wherein said  
concentration of said particulate varies from high to low over said fluid flow  
area;

10 positioning said at least one planar filter where said concentration of said particulate is  
low;

positioning said at least one pocket filter where said concentration of said particulate is  
high.

15 33. The method of claim 32 further comprising monitoring said planar and  
pocket filter to determine when each filter needs to be replaced.

34. The method of claim 33 further comprised arranging said planar and  
pocket filters so that each filter needs replacement at generally the same time.

20 35. The method of claim 32 further comprised arranging said planar and  
pocket filters so that each filter needs replacement at generally the same time.

36. In combination:  
a filter frame having an upper frame member, a lower frame member, and first and  
second side frame members;

1 a filter having an upper section, a lower section, and first and second side sections,  
and a pocket body portion extending therefrom in the direction of air flow;  
said upper, lower sections and said first and second side section of said filter being  
selectively removably secured to said upper, lower, first and second frame  
5 members, respectively.

37. The combination of claim 36 wherein said filter includes at least two  
pocket body portions.

38. The combination of claim 37 wherein each of said frame members  
10 comprises:

an elongated channel member including a first wall member having first and second  
ends; a second wall member having first and second ends, said first end of said  
second wall member being positioned adjacent said second end of said first  
wall member, said second wall member extending at an angle from said first  
wall member; a third wall member having first and second ends, said first end of  
15 said third wall member being positioned adjacent said second end of said second  
wall member, said third wall member extending at an angle from said second  
wall member so as to be generally parallel to said first wall member; a  
fourth wall member having first and second ends, said first end of said fourth  
wall member being positioned adjacent said second end of said third wall  
member, said fourth wall member extending at an angle from said third wall  
20 member towards said first wall member; said second end of said fourth wall  
member engaging said flexible filtration media and being spaced from said first  
wall member.

1 wall member to provide an opening therebetween into which the filtration media  
may be inserted and at least partially selectively maintained;  
said first wall member having a plurality of spaced-apart filtration media engagement  
points formed therein in said first end thereof for at least partially selectively  
5 maintaining said flexible filtration media.

39. The combination of claim 3 wherein said filter frame associated with said  
pocket filter has at least one inner frame member which defines a space for said  
pocket portion.

10 40. The combination of claim 1 wherein each of said filter frames comprises  
multiple outer frame members; each of said filter frames having at least one inner  
frame member extending between said outer frame members.

41. The combination of claim 8 wherein said filter frame of said pocket filter  
has at least one inner frame member which defines a space for said pocket portion.

15 42. A method of using the device according to claim 2, comprising:  
providing a fluid flow area having consistent particulate concentration throughout that  
requires filtering of the particulate wherein it is desired to predetermine a filter  
replacement schedule falling between the minimum replacement schedule  
20 established by planar filters and the maximum replacement schedule as  
established by pocket filters;  
increasing the number of planar filters relative to pocket filters to lessen the amount of  
captured particulate that necessitates filter replacement;

1 increasing the number of pocket filters relative to planar filters to increase the amount  
of captured particulate that necessitates filter replacement.

43. The method of claim 42 further comprising:  
monitoring the overall filtered fluid flow area relative to the desired replacement  
5 schedule;

increasing the number of pocket filters relative to the number of planar filters if the  
actual replacement schedule is less than the desired replacement schedule;

increasing the number of planar filters relative to the number of pocket filters if the  
10 actual replacement schedule is greater than the desired replacement schedule.

44. The method of claim 42 further comprising:  
providing a fluid flow area that requires filtering of a particulate wherein it is desired to  
15 predetermine a filter replacement schedule falling between the minimum  
replacement schedule established by planar filters and the maximum  
replacement schedule as established by multiple pocket pocket filters;

increasing the number of planar filters relative to multiple pocket pocket filters to  
lessen the amount of captured particulate that necessitates filter replacement;

increasing the number of multiple pocket pocket filters relative to planar filters to  
20 increase the amount of captured particulate that necessitates filter replacement;

exchanging multiple pocket pocket filters for pocket filters having fewer pockets to  
fractionally change the replacement schedule by a lesser amount than the  
change that would have occurred if the multiple pocket pocket filter had been  
25 exchanged for a planar filter.

1           45. The method of using the device according to claim 2 wherein it is desired  
to change the efficiency of filtration without affecting the pressure drop across the  
device using low efficiency, low pressure drop planar filters when lower efficiency is  
required and replacing the planar filters with a combination of high efficiency, high  
5           pressure drop filters in planar, pocket or multiple pocket configurations, as required.

10          46. The method according to claim 45 wherein the pressure drop across the  
fluid handling device is monitored; increasing the number of high efficiency planar  
filters to increase the pressure drop; increasing the number of high efficiency multiple  
pocket filters to decrease the pressure drop; replacing multiple pocket filters with  
single pocket filters to increase the pressure drop less than the increase that would be  
obtained by replacing the multiple pocket filter with a planar filter.

15          47. The method of using the device according to claim 2 comprising:  
providing a fluid flow area requiring particulate filtration wherein it is desired to vary the  
fluid flow rate in various zones in the fluid flow area;  
providing planar filters in those zones requiring lesser flow rates;  
providing multiple pocket filters in those zones requiring higher flow rates; and  
providing single pocket pocket filters in those zones requiring a higher fluid flow rate  
20          than is achieved by planar filters and a lower flow rate than is achieved by  
multiple pocket filters.